

## WHAT IS CLAIMED IS:

1. A MEMS (micro electro mechanical system) apparatus comprising:

a light-emitting circuit, having a light-emitting device, to emit light;

a light-receiving circuit having a series circuit of series-connected light-receiving devices that receive the emitted light to generate a voltage; and

a MEMS assembly driven by the generated voltage.

2. The MEMS apparatus according to claim 1, wherein the MEMS assembly includes an RF-MEMS switch.

3. The MEMS apparatus according to claim 1, wherein the MEMS assembly includes series-connected RF-MEMS switches.

4. The MEMS apparatus according to claim 2, wherein the MEMS assembly includes wiring impedance matched with the RF-MEMS switch.

5. The MEMS apparatus according to claim 1, wherein the MEMS assembly includes a first RF-MEMS switch and a second RF-MEMS switch connected in series, and a third RF-MEMS switch, an end of the third RF-MEMS switch being connected to a node of the first and the second RF-MEMS switches, another end of the third RF-MEMS switch being grounded.

6. The MEMS apparatus according to claim 1, wherein the MEMS assembly includes parallel-connected RF-MEMS switches.

7. The MEMS apparatus according to claim 1, wherein the MEMS assembly includes an RF-MEMS switch having a switching contact.

8. The MEMS apparatus according to claim 1, wherein the MEMS apparatus is packaged, the light-emitting device and the

light-receiving circuit being optically coupled through a silicon optical tube.

9. The MEMS apparatus according to claim 1 further comprising a discharging circuit to discharge a voltage generated across the series circuit when emission of light from the light-emitting circuit is brought in a halt.

10. The MEMS apparatus according to claim 9, wherein the discharging circuit includes a junction field-effect transistor, a drain of the transistor being connected to a high-potential terminal of the light-receiving circuit via a first resistor, a gate of the transistor being connected to the high-potential terminal via a second resistor, and a source of the transistor being connected to a low-potential terminal of the light-receiving circuit.

11. The MEMS apparatus according to claim 1, wherein the light-receiving circuit and the MEMS assembly are fabricated on a semiconductor chip, the light emitting circuit and the light-receiving circuit being optically coupled via a photocoupler.

12. The MEMS apparatus according to claim 1, wherein the light-receiving circuit and the MEMS assembly are fabricated on a semiconductor chip, the light emitting circuit and the light-receiving circuit being optically coupled via a photoguide.

13. A MEMS (micro electro mechanical system) apparatus comprising:

- a first light-emitting circuit, having a first light-emitting device, to emit light;

- a second light-emitting circuit, having a second light-emitting device, to emit light;

- a first light-receiving circuit having a series circuit

of series-connected light-receiving devices that receive the light emitted from the first light-emitting circuit, to generate a voltage;

a second light-receiving circuit having a series circuit of series-connected light-receiving devices that receive the light emitted from the second light-emitting circuit, to generate a voltage;

a discharging circuit to discharge a voltage generated across the series circuit of the second light-receiving circuit when emission of light from the second light-emitting circuit is brought in a halt;

a MEMS assembly including an RF-MEMS switch having a first electrode connected to a high-potential terminal of the first light-receiving circuit and a second electrode;

a resistive element provided between the first and second electrodes; and

a MOS switch, a drain of the MOS switch being connected to the second electrode, a source of the MOS switch being connected to a low-potential terminal of the first light-receiving circuit, and a gate of the MOS switch being connected to a high-potential terminal of the second light-receiving circuit via the discharging circuit.

14. The MEMS apparatus according to claim 13, wherein the MEMS assembly includes an RF-MEMS switch.

15. The MEMS apparatus according to claim 13, wherein the MEMS assembly includes series-connected RF-MEMS switches.

16. The MEMS apparatus according to claim 14, wherein the MEMS assembly includes wiring impedance matched with the RF-MEMS switch.

17. The MEMS apparatus according to claim 13, wherein the MEMS assembly includes a first RF-MEMS switch and a second RF-MEMS switch connected in series, and a third RF-MEMS switch,

an end of the third RF-MEMS switch being connected to a node of the first and the second RF-MEMS switches, another end of the third RF-MEMS switch being grounded.

18. The MEMS apparatus according to claim 13, wherein the MEMS assembly includes parallel-connected RF-MEMS switches.

19. The MEMS apparatus according to claim 13, wherein the MEMS assembly includes an RF-MEMS switch having a switching contact.

20. The MEMS apparatus according to claim 13, wherein the MEMS apparatus is packaged, the light-emitting device and the light-receiving circuit being optically coupled through a silicon optical tube.

21. A MEMS (micro electro mechanical system) apparatus comprising:

- a light-emitting circuit, having a light-emitting device, to emit light;

- a first light-receiving circuit having a first series circuit of series-connected light-receiving devices that receive the light emitted from the light-emitting circuit, to generate a voltage;

- a second light-receiving circuit having a second series circuit of series-connected light-receiving devices that receive the light emitted from the light-emitting circuit, to generate a voltage, a high-potential terminal of the second series circuit being connected to a low-potential terminal of the first light-receiving circuit;

- a resistive element connected in parallel to the first light-receiving circuit;

- a junction field-effect transistor, a drain of the transistor being connected to the high-potential terminal of the second series circuit, a source of the transistor being connected to a low-potential terminal of the second series

circuit, and a gate of the transistor being connected to a high-potential terminal of the first series circuit; and  
a MEMS assembly driven by the voltage generated by the second light-receiving circuit.

22. The MEMS apparatus according to claim 21, wherein the MEMS assembly includes an RF-MEMS switch.

23. The MEMS apparatus according to claim 21, wherein the MEMS assembly includes series-connected RF-MEMS switches.

24. The MEMS apparatus according to claim 22, wherein the MEMS assembly includes wiring impedance matched with the RF-MEMS switch.

25. The MEMS apparatus according to claim 21, wherein the MEMS assembly includes a first RF-MEMS switch and a second RF-MEMS switch connected in series, and a third RF-MEMS switch, an end of the third RF-MEMS switch being connected to a node of the first and the second RF-MEMS switches, another end of the third RF-MEMS switch being grounded.

26. The MEMS apparatus according to claim 21, wherein the MEMS assembly includes parallel-connected RF-MEMS switches.

27. The MEMS apparatus according to claim 21, wherein the MEMS assembly includes an RF-MEMS switch having a switching contact.

28. The MEMS apparatus according to claim 21, wherein the MEMS apparatus is packaged, the light-emitting device and each light-receiving circuit being optically coupled through a silicon optical tube.

29. The MEMS apparatus according to claim 21 further comprising a discharging circuit to discharge a voltage

generated across the series circuit of each light-receiving circuit when emission of light from the light-emitting circuit is brought in a halt.

30. The MEMS apparatus according to claim 29, wherein the discharging circuit includes a junction field effect transistor, a drain of the transistor being connected to a high-potential terminal of each light-receiving circuit via a first resistor, a gate of the transistor being connected to the high-potential terminal via a second resistor, and a gate of the transistor being connected to a low-potential terminal of each light-receiving circuit.

31. The MEMS apparatus according to claim 21, wherein each light-receiving circuit and the MEMS assembly are fabricated on a semiconductor chip, the light emitting circuit and each light-receiving circuit being optically coupled via a photocoupler.